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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/604,218	06/27/2000	Tulin Kuzulugil Hidayetoglu	98-R-CLU-363	4131

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EXAMINER

TSOY, ELENA

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 01/28/2002

61

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/604,218

Applicant(s)

HIDAYETOGLU, TULIN
KUZULUGIL

Examiner

Elena Tsoy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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Response to Amendment

1. Amendment filed on November 28, 2001 has been entered.

Election/Restrictions

2. Non-elected claims 16-19 have been cancelled. New claim 20 has been added.

Applicant's election with traverse of Group I, claims 1-15 in Paper No. 5 is acknowledged. The traversal is on the ground(s) that that the inventions of Group I, claims 1-15, and Group II, claims 16-19, are not separate or distinct because claims 16-19 are drawn to making the friction material of claims 1-15, 20. This is not found persuasive because under 35 U.S.C. 121 the inventions are distinct, each from the other, if the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by materially different process comprising a step of distributing a plurality of heat conducting elements in a resin matrix either without the step of weaving the heat conducting elements with a plurality of fibers or without the step of inserting the heat conducting elements in non-hardenable resin matrix to form a functionally graded material.

The requirement is still deemed proper and is therefore made FINAL.

Claims 16-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 5.

Specification

3. Objection to the disclosure has been withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1-15, 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibata et al (US 5,004,497) in view of Nishimoto et al (US 4,784,893).

Shibata discloses a friction material with improved wear resistance and thermal conductivity (See column 2, lines 1-3; column 3, lines 63-68; column 4, lines 1-4), comprising:
a functionally graded material including a composite material having heat and wear resistant fibers therein impregnated with a resin (See column 2, lines 56-58; column 3, lines 6-7, 63-68; column 4, lines 1-4);

a plurality of heat conducting elements situated within said functionally graded material wherein said heat conducting elements prevent vapor locking of the brake (transfer heat away from one surface of said functionally graded material to another) (See column 3, lines 63-66; column 4, lines 31-65).

Shibata fails to teach that:

the heat conducting elements are positioned within said functionally graded material in a predetermined arrangement (Claims 2, 11),

the heat conducting elements are positioned within said functionally graded material in a varying concentration (Claims 1, 11);

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Nishimoto teaches that thermal conductivity of a functionally graded material is increased when the filling rate (concentration) of heat conducting elements is improved (See column 5, lines 50-68). For example, in order to effectively dissipate heat generated by an element mounted on a conductor 4 using an insulating layer 6 (functionally graded material) (See Fig. 3; column 4, lines 53-65) so as to keep the temperature of a metal substrate 3 as low as possible, the filling rate (concentration) of heat conducting elements within said insulating layer 6 (within said functionally graded material) near the substrate 3 should be higher than near conductor 4 (See Figs. 3, 5A, 5B, 6; column 5, lines 55-63; column 7, lines 43-45, 54-62; column 6, lines 1-25). If a fibrous heat conducting elements are used, heat transfer in a fiber length direction increases to a great extent (See Figs. 3, 5A, 5B; column 6, lines 1-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned the heat conducting elements within a functionally graded material of Shibata in an orientation and a varying concentration in order to vary extent and direction of transfer heat, as taught by Nishimoto, depending on particular application.

As to claims 2, 6, 12, 13, 14, Shibata teaches that the plurality of heat conducting elements comprise carbon fibers, copper powder, copper alloy powder, graphite. See column 2, lines 56-68; column 3, lines 63-66.

As to claims 4, 5, 7, Shibata teaches that the heat and wear resistant fibers comprise carbon fibers, aramid fibers (e.g., Kevlar fibers). See column 2, lines 56-68; column 3, lines 8-10, 63-68; column 4, lines 1-30.

As to claims 9, 10, Shibata teaches that the friction material comprises brake pads, clutch facing material. See column 1, lines 11-14.

As to claims 3, 8, 15, 20, combination of Shibata and Nishimoto fails to teach that the heat conducting elements are positioned within said functionally graded material substantially normal to a friction (engaging) surface (first friction surface) of said functionally graded material (Claims 3, 15), and the heat conducting elements comprise greater density on the first engaging surface than second non-engaging surface (Claims 8, 20).

According to Nishimoto, orientation and concentration of heat conducting elements within a functionally graded material are result-effective variables. It is held that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have discovered by routine experimentation the optimum orientation (including claimed predetermined arrangement such as substantially normal to a first friction surface) and optimum concentration distribution (including claimed greater density on the first engaging surface than second non-engaging surface) of the heat conducting elements within said functionally graded material of friction material of combination of Shibata and Nishimoto.

Response to Arguments

6. Applicant's arguments filed November 28, 2001 have been fully considered but they are not persuasive.

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Applicant states that Shibata does not teach or suggest a claimed functionally graded material as defined on page 4, lines 22-26 of the specification as filed (See Applicant's Remarks, page 4, last 6 lines).

However, Shibata's composite material comprising metal powders and fibers spatially distributed in a resin binder is in fact a claimed functionally graded material since the material is defined on page 4, lines 22-26 of the specification as filed as a microstructure tailored in terms of spatial distribution and concentration of different material phases or elements.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is (703) 605-1171. The examiner can normally be reached on 9:00-5:30.

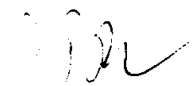
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

ET

Elena Tsoy
Examiner
Art Unit 1762

January 24, 2002


SHRIVE P. BECK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700